

Capacity Building for Landscape Conservation

~ National Technical Advisory Team ~

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Draft

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Take Home Message

- Above all, establish a networked, continental wide geographic framework for landscape conservation.
- We previously provided input in our February 19, 2009 “Assessment of Regional Responses” report and have used this current assignment to continue building on that body of work.
- Clearly define and articulate LCCs, using a geographic framework, and featuring a common purpose and consistent functions and services among units. This will ensure well-integrated data for seamless spatial modeling of species and habitats and to ensure effective tracking of our conservation progress across the nation.
- LCCs are a partnership among science and management that agree to create a shared conservation science capacity and collaboratively work toward landscape sustainability.
- LCC should have a core of co-located, dedicated staff, taking day-to-day direction from a team leader. We question the feasibility and ultimate performance of an entirely “virtual LCC.” We advocate, however, supplementing the core team with “virtual” capacity by establishing clear avenues for individual experts (including land managers) to engage in the planning process.
- Establish LCCs in Landscape Conservation Regions (LCRs) which are aggregates of BCRs or similar ecological systems and prioritize timing and funding levels by national or international significance. Modifications may occur later, but should have an ecological basis. Following the example of Joint Ventures, we recommend a single lead region for each BCR or group of BCRs covered by an LCC.
- Augment the science and technical capacity, and conservation delivery partnerships that exist in Joint Ventures and similar groups to create the first LCCs.
- Continue formal discussions on how best to implement landscape conservation and our strategic plan for climate change. There exists a variety of perspectives on LCCs and their relationship to the organization and the conservation community. Further, we recommend analyzing current personnel expertise and placement as a prelude to developing a short- and long-term staffing plan for capacity building. The value we place on the SHC framework elements must be defined and related to the current and future workforce.

Background

The U.S. Fish and Wildlife Service (Service) will use a landscape approach to address 21st century conservation challenges. Both the National Ecological Assessment Team (NEAT) Final Report (2006) and the draft Strategic Plan for Responding to Accelerating Climate Change (SPCC) in the 21st Century (2008) articulate this need, and the organizational change required, including a broader and interdependent sense of collaboration and partnership. Capacity for “Strategic Habitat Conservation”, our brand name for landscape conservation, must improve to ensure sustainability of fish, wildlife and their habitats in the face of this century’s large scale challenges, including abrupt and accelerating climate change.

US Fish and Wildlife Service Conservation Vision for the 21st Century

We will succeed in conservation amid unprecedented climate change through:

- ✓ Strategic focus on landscapes;
- ✓ Connected networks of habitats;
- ✓ Interdependent relations in science and resource management; and
- ✓ Engagement and empowerment of the American public in support of conservation

As Service budget, performance, policy, and field operations adjust to this conservation vision and the expectation of partners, a number of fundamental “why” questions arise. Please refer to both the NEAT report and the draft SPCC for a detailed discussion on the fundamental purpose and reasoning for repositioning our bureau, both for mission pursuit and to better serve the broader conservation community.

Questions of “how”, on the other hand, are driving an analysis to best define and deliver capacity for SHC and whether a geographic frame of reference would improve our ability to succeed. The former has centered on the concept of Landscape Conservation Cooperatives (LCCs), and for the latter, the Directorate and Deputies have planned a Structured Decision Making (SDM) process for April 21, 2009 (see Box 1).

To support these questions and efforts, the National Technical Advisory Team (TAT) was asked by the SDM managers and the TAT Executive Oversight Council to provide input on LCC functions and services, the purpose and options for a common geographic framework, and how LCCs might relate to the larger conservation community. The context remains our vision for the 21st century as noted above, with landscape conservation as a means to our mission and climate change serving as an urgency factor.

Box 1- SDM for a Geographical Framework for SHC – April 21, 2009

Goal - Conduct a SDM process to answer the following questions:

- Will a geographic frame of reference improve SHC framework implementation?
- If so, do we need a geographic framework that is common to all regions?
- If so, which geographic framework should we use?

Participants

- Directorate and Deputies - USFWS

Participant Time Commitments

- 2 short electronic surveys
- 2 conference calls (up to 1.5 hours each)

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I. Landscape Conservation Cooperatives

- Spatial and Temporal Scale
- Functions and Services
- Core Capacities

The Service is developing a partnership-based national network of LCCs that will integrate science and management in support of landscape-scale biological planning, conservation design, monitoring, and

research. Doing so will allow us to leverage resources, targeting the highest conservation priorities within and across landscapes nation-wide. As we catalyze an LCC network, we must clearly define accompanying spatial and temporal scales, biological functions and services, organizational composition, roles and responsibilities, and ownership and accountability. This document will focus on the spatial scale (landscape) and functions of LCCs.

“If we are serious about sustainability, we must raise our focus in management and planning to large landscapes and beyond”. Eugene Odum

Spatial and Temporal Scale – Little debate exists that LCCs need to operate at landscape scales. The definition of *landscape* varies considerably, however, and we will discuss the issue of “geographic framework” below. Temporal scale also presents little debate – LCCs will incorporate past, present, and future conditions as part of their responsibilities.

Functions and Services – Most agree that LCCs will house the science capacity to perform or coordinate the geospatial analysis functions of SHC. However, opinions vary on how LCCs will operate in relation to management. We are concerned with descriptions that define the relationship between LCC science capacity and management as informal and flexible. To the contrary, we believe LCCs must couple science capacity explicitly and integrally with management. A conservation delivery-science alliance among states, federal agencies, tribes, NGOs, universities, and other entities will produce integrated capacity, leverage the resources of the conservation community to meet shared goals, and re-engineer decision-making processes to link biological planning, conservation design, conservation delivery, and monitoring and research iteratively in an adaptive cycle of science and management.

This broader view of an LCC represents a formal relationship between the management and science communities wherein each participates in *creating a shared conservation vision and commits to creating the science capacity* needed to efficiently achieve that vision. This relationship will see LCCs formally, and in some cases, informally, linked to the broader conservation and science community (often referenced as a virtual capacity). While the organizational structure among LCCs may vary, it is important that they provide common functions and services to include science, technology, and partnership development support to the Service and the conservation partners within a “landscape.”

Science and Technology Support – Provide science and technology support to conservation partners in each of the functional elements of the SHC framework.

- **Biological Planning** – Science support includes collaborative development of: 1) consistent approaches for selecting representative subsets of priority species; 2) protocols and procedures leading to the establishment of goals and objectives for these species that reflect measurable biological outcomes expressed at multiple spatial scales, and 3) transparent, replicable methods and procedures for translating the objectives of national and international conservation plans, state-specific comprehensive wildlife conservation plans, and recovery plans to on-the-ground habitat and other conservation objectives. Technology support includes development of spatial and temporal datasets encompassing a variety of information on populations and their limiting

factors and desktop or web-based applications supporting biological planning at ecoregional scales.

- **Conservation Design** – Science support includes collaborative development of transparent, replicable processes and procedures for spatially integrating the biological goals and objectives established for different species groups; different management practices (e.g. forest protection vs. forest restoration), and different ecological functions and processes (e.g. natural flood storage vs. breeding productivity of area-sensitive wildlife). It also encompasses development of decision support tools used to guide managers in targeting conservation programs, projects, and practices to most efficiently achieve these objectives by predicting changes in carrying capacity based on conservation actions and current and anticipated perturbations (e.g., land-use and climate induced changes). Technology support includes the development of spatial and/or temporal datasets and desktop or web-based applications that support partners in spatially integrating goals and objectives with conservation delivery.
- **Conservation Delivery** – Provide products, decision support tools, and information to facilitate strategic conservation delivery, including restoration, management, habitat protection, law enforcement, issuing permits, development of multi-agency collaborative conservation delivery programs, and engaging non-traditional organizations. Managers must engage in this process of tool development to ensure efforts are relevant and responsive to their needs.
- **Decision-based Monitoring** – Science support includes developing statistically valid, collaborative population and habitat monitoring programs that are linked to and support agency decision-making processes. Technology support includes the development of data management systems for collecting, storing, managing, retrieving, and disseminating data and information flowing from collaborative monitoring efforts and the development of spatial and/or temporal datasets and desktop or web-based applications for spatially tracking and evaluating conservation delivery.
- **Assumption-driven Research** – Science support includes developing and facilitating research projects focused explicitly on the documented assumptions and uncertainties resulting from Biological Planning and Conservation Design activities. Technology support includes the development of spatial and relational datasets that support development of statistically valid study designs and the analysis of research-generated data.

Partnership Development and Coordination – This core function is defined as guiding, facilitating, and nurturing a shared and networked science and management infrastructure supporting the iterative application of the partnership’s landscape conservation framework.

Core Capacities

Core capacities and recommended staff positions needed to perform the functions specific to science and technology support are described in Appendix C of the National Ecological Assessment Team (NEAT) Final Report (2006). This capacity is shared among the conservation partnership in the LCC area. We recommend a preferred business model that includes a core team of co-located, dedicated staff, taking day-to-day direction from a single team leader. If the core capacity includes staff located in different offices, it is important that those individuals be dedicated staff rather than serve in a collateral-duty capacity; and that they report to the LCC team leader.

II. Geographic Framework

- Purposes
- Options
- Recommendation for a national geographic framework
- Initial development and placement of LCCs

The paragraph below was developed as a hypothetical description of purpose and attributes of a geographic framework for implementing SHC.

“The primary purpose of a geographic framework for FWS’s implementation of SHC is to provide the spatial context for science at landscape- and population-scales. The framework is

comprehensive without gaps or overlaps throughout areas of FWS jurisdiction and interest. The framework is scalable to allow managers to engage SHC science support where the management problems exist, and to enable habitat modeling within areas of ecological homogeneity. The framework provides a FWS-wide network of scientifically credible analytical units for optimizing conservation efficiency for priority species that can be fairly compared across the network. The framework provides a dependable long-term framework for strengthening existing partnerships and building new ones. However, changes in the boundaries are possible as information becomes available and recognized authorities on the framework refine and adjust boundaries. The framework does not necessarily match FWS administrative boundaries or areas of common interest with some of our most important partnerships (e.g., states); FWS operations will need to be creative, flexible, well coordinated across Regions and Programs to facilitate science delivery across boundaries. Capacity for landscape- and population-scale science will not substitute nor diminish the need for highly skilled scientists and technicians at the project level.”

We offer these purposes, attributes and options in considering a national geographic framework:

Purposes

A national geographic framework should support the purpose and function of LCCs, ensuring:

- A biological planning framework to support conservation delivery, monitoring, evaluation and research;
- Each LCC has a well-defined landscape within which it provides scientific and decision support, data storage, and application to address a variety of species, communities, and resource issues;
- Full spatial coverage to sustain populations at continental scales and meet international obligations;
- Minimize duplication of spatial coverage or effort, and to avoid conflict;
- That an overall LCC network can accommodate and link planning efforts at multiple scales; and
- Effective guidance for funding allocation, programmatic direction, and organizational change.

Other DOI bureaus are considering geographic frameworks for monitoring and conservation delivery. The National Park Service, for example, has proposed collapsing their 32 inventory and monitoring networks into 16 bioregions that encompass the entire United States. Further, the Bureau of Land Management has implemented their Healthy Lands Initiative, which provides a geographic framework for lands in the western United States. Similarly, the USGS has proposed a National Climate Change and Wildlife Science Center with regional hubs to deliver climate change science support. As a result, there exists great potential for interdependency with facilities and capabilities developed by other bureaus with the geographic-based framework developed by the Service.

In the end, we need a geographic framework to aid in the efficient and effective development and application of science capacity in our vision to create landscapes capable of sustaining populations of priority species.

Options

There are several approaches to developing national network of LCCs. Identifying ecoregionally-based geographic units that encompass all or portions of priority trust species ranges in which these populations are most limited represents a primary consideration. Clearly, the geographic framework (or frameworks) for developing science capacity for a broader range of trust resource priorities must evolve from explicitly stated purposes and priorities.

1. Use the existing partner-based international network of Landscape Conservation Regions (LCRs, formerly called BCRs) that were developed and are being used to guide the conservation of birds across North America. LCRs were created by aggregating Omernik (EPA) Level III and IV ecoregions, and are based on similarities in land use, habitat threats, and management approaches. In some cases, it will be useful to aggregate LCRs or apportion LCRs along interior Level III and IV lines
2. Use a hierarchical system of watersheds that are classified according to hydrologic unit codes (HUCs) as were adopted by the Service in the early 1990s. In some cases, hydrologic units better address aquatic trust species but tend to combine parts of diverse ecoregions resulting in habitat heterogeneity that is not functional for biological planning and monitoring of terrestrial ecosystems.
3. Use the existing Service administrative regions or subdivide existing Service regions into smaller subregions following state boundaries for purposes of providing additional science capacity. Although this would align with administrative boundaries, this option may be the most inefficient strategy for capacity building as it is not very effective for grouping similar land cover, land use, threats or aquatic or terrestrial trust species.
4. Use LCRs to organize biological planning and monitoring for terrestrial species and watersheds to organize biological planning and monitoring for aquatic species and to then to translate this information through conservation design to the Service Region, state or partnership scales. Under this option, LCCs would be located in Regions in places best able to provide science support to multiple partnerships. This may satisfy concerns expressed from resource managers from the two broad ecological disciplines. However, it has the effect of regarding the terrestrial and aquatic components as independent systems within a landscape which is simply erroneous in that they do not and can not exist apart from one another.
5. As a slight modification from the fourth option, draw from Omernik and Bailey's work on *Distinguishing Between Watersheds and Ecoregions* (1997). There they recommend that "neither ecoregions or hydrologic units alone be used for ecosystem management." They provide ecological rationale for a complementary approach "where ecoregions provide the spatial framework within which the quality and quantity of environmental resources, and ecosystems in general, can be expected to exhibit a particular pattern. This includes where watersheds are relevant for studying the relationships of natural and anthropogenic phenomena with water quality, as well as for providing the spatial unit for reference areas with ecoregions at all scales."

Concluding, it is important that LCCs support and build upon existing conservation partnerships and do not duplicate or make irrelevant these partnerships and jurisdictions; however, it is not essential (but desirable) that the conservation delivery programs and partnerships conform to the same boundaries as LCCs, although it is necessary that LCC team members establish good relationships with managers within

the geographic area of responsibility of LCCs. We do not consider any change to Service administrative boundaries to be necessary or appropriate.

Recommendation for a National Geographic Framework

Given that the BCR framework (hereafter LCRs) meets the recommendations presented for identification of geographic boundaries and that existing joint venture partnerships are built around this geographic framework, we recommend that for now, LCCs be established within aggregates of LCRs or large, single LCRs. However, we also recommend that within LCRs biological planning for aquatic species should utilize watersheds where resource managers deem appropriate. Another benefit of utilizing LCRs is that they were developed for the entire continent thereby extending into Canada and Mexico facilitating international coordination that will be necessary when dealing with long-term climate change. These LCR-based LCC boundaries are not inviolate. They are meant to facilitate biological planning, conservation design and monitoring but not to constrain science, management or existing partnerships. These boundaries should be used to the extent that they make biological and conservation sense for the stated purposes. LCCs would also support biological planning and monitoring for aquatic species organized by hydrologic units in the same landscapes. In cases where LCRs cross Regional boundaries, a lead region should be established. It is important to note that there exists a national network of ecoregionally-based Joint Venture bird conservation partnerships and emerging aquatic resource partnerships with establish multi-agency management and technical working groups. Forming new or overlapping partnerships may result in state or NGO leadership and staff feeling overextended and force them to choose one partnership at the expense of the other.

It is also important to note that in a world of accelerated climate change, any eco-geographical framework cannot remain static; boundaries will adjust as biomes and ecoregions move across the landscape and future adjustments to boundaries are expected as priorities are identified and/or change.

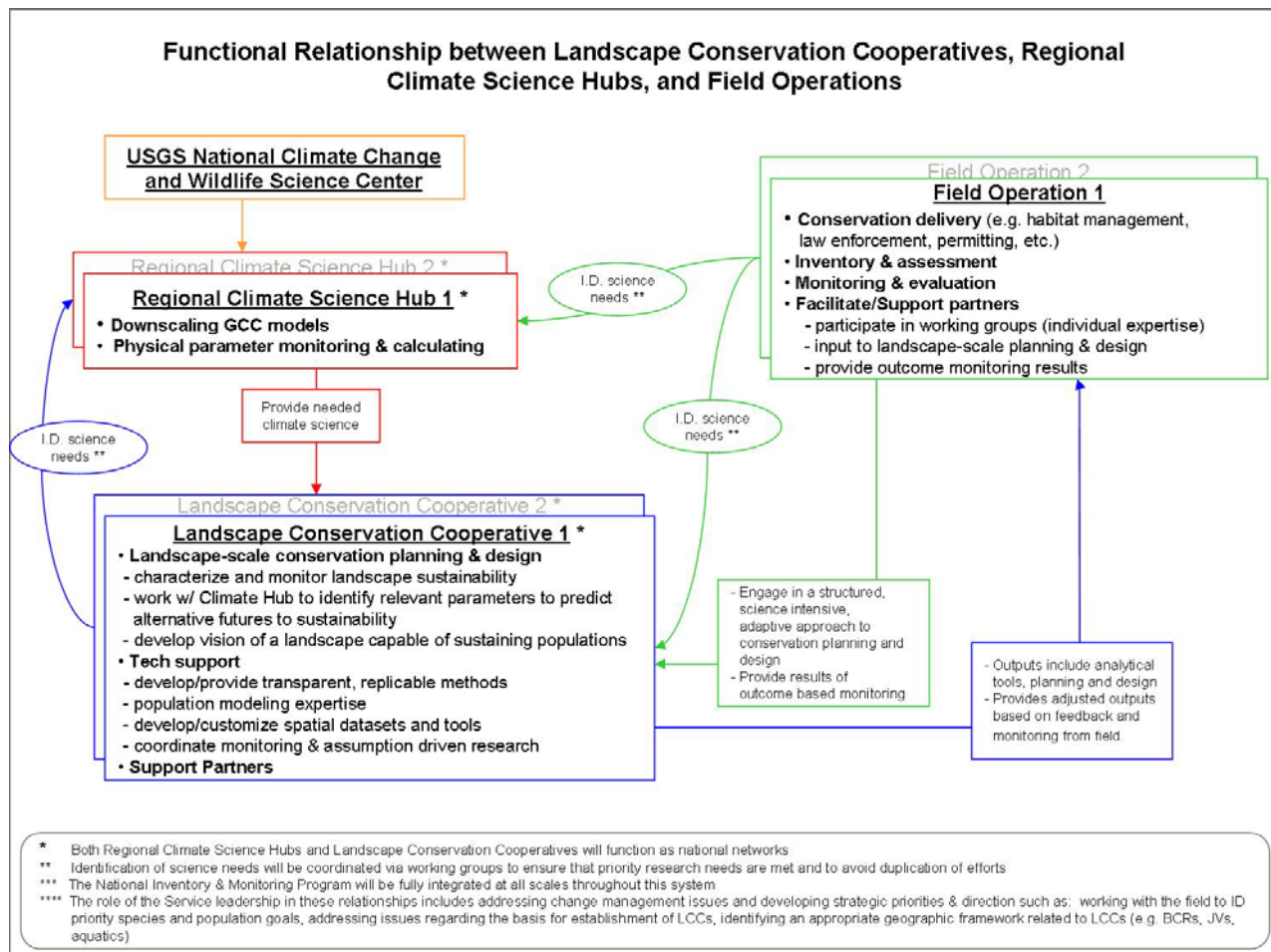
Initial Development and Placement of LCCs

The initial development and placement of LCCs by each Region should be based on the functions, services and core capacities described above and the recommended national geographic framework but each Region should have the flexibility to establish LCCs that augment existing partnerships.

When deciding where to establish the first LCCs, we recommend Regions consider the following criteria:

- Location of priority trust resources;
- Availability of scientific expertise;
- Management demand (managers are asking for the new capacity);
- Existing partnerships (quantity and quality);
- Availability of spatial data;
- Areas having experienced the most radical alterations; and
- Areas likely to experience the most radical alterations in the future.

III. Relationship between LCC's & the Conservation Enterprise



To facilitate dialogue and *change management* within the Service as it embraces and promotes Landscape Conservation, the above figure suggests a functional relationship between existing Service capacity and an emerging conservation science infrastructure. In defining Landscape Conservation, we recognize the need to work beyond our boundaries and accept interdependency as an organizing principle.

Primary FWS Relationships

Field Operations – Deliver on-the-ground conservation and coordinate and conduct program and project planning to align site-scale and project-scale decisions in the context of landscape-scale objectives; inventory and assess conservation actions; track accomplishments. Work with LCCs by participating in broad-scale coordinated monitoring.

Landscape Conservation Cooperatives – Provide science support to managers and partnerships responsible for developing and implementing conservation strategies in broad geographic frameworks, with an emphasis on biological planning and conservation design; acquisition of biological and spatial data, research and related activities. Coordinate with Regional Climate Change Hubs to ensure downscaled global General Circulation Models (GCM) incorporate relevant habitat and environmental parameters to forecast biological response to alternative landscape changes.

Regional Climate Science Hubs – Inform biological planning by LCCs by providing relevant predictions of future climate states. Sometimes aid LCCs in predicting changing in biotic ecosystem components (e.g., habitat characteristics). Coordinate the means and methods for downscaling global General Circulation Models to relevant scales useful for biological assessment and conservation design; evaluate uncertainties in regional models; facilitate the development of climate knowledge networks among partners and LCCs.

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